GENETICISM AND THE CONCEPTS OF EDUCATIONAL PSYCHOLOGY

BY
MELVIN WALLACE BARNES
A.B., Greenville College, 1932
M.S., University of Illinois, 1934

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It has been the purpose of this study to relate certain facts and principles concerning the nature of growth, taken in its end-to-end completeness, to several of the major concepts of educational psychology. These concepts were selected as an avenue of approach to the problem because at no other point does the current emphasis upon growth come into as sharp conflict with the static point of view. The development of the thesis has proceeded on the assumption that neither teaching nor learning procedures can be administered apart from a basic psychology of education. This psychology, it has been argued, must rest upon facts about the nature of growth, and particularly, upon facts about the properties of growth patterns in their time-wise extension and organization.

In order to carry out this program, it was necessary to draw certain distinctions between two points of view which have been designated the "genetic" and the "static". These two points of view, it has been shown, are served by two methods of inquiry which may be distinguished, for general purposes, by reference to their relationship to the passage of time. The genetic method, on the one hand, is fundamentally historical in its mode of ordering data. In the observation of events, both as matters of fact and as forms of relatedness, genetic description accepts the temporal coordinate as a highly significant element in the understanding of present phenomena. Genetic description, accordingly, employs principles and constructs which are sufficiently descriptive of the temporal patterning of events. From the genetic point of view, the routes which events are observed to follow can be described by such concepts as "continuity", "directedness", "serial order", "emergence", "progressive individuation", and a variety of others. Each of these springs from the observation of data viewed in

their longitudinal or time-wise extension rather than in their cross-sectional or structured immediacy.[1]

Historically, the genetic method, as it applies to the study of behavior, has been characteristic of the association psychologies, being a logical correlate of the emphasis which these psychologies place upon past history as a source of information about a person.[2] In this connection, the biographical method of Galton and Freud may be cited also as an example of genetic description, even though the latter, at least in the doctrine of instinctual urges, draws close to agenetic principles.

In contrast to the genetic, the agenetic or static method is characteristically cross-sectional with respect to the concept of a time-wise continuum, and deals with its object of study, therefore, in terms of the structure of the immediate situation or field of operations. Psychologists who employ this approach to behavior search for the primary facts about psychological phenomena in the structured immediacy of events. It is a basic assumption of topological psychology, for example, that the dynamics of behavior are dependent upon the immediate structure of the force field rather than upon the past history of the behaving organism. This is a point at which field theories in psychology differ from association and conditioning theories.[3]

Concern with structured immediacies logically leads to spatial description, so that the temporal antecedents of the present situation, and even of the principles which govern it, become almost an irrelevant scientific enterprise. Upon the assumption that when the laws of dynamics are further developed, "one can predict the future quite independently of the past",[4] psychology has been classed with chemistry and physics

1. Griffith, C. R. *An Introduction to Educational Psychology.* New York: Farrar and Rinehart, Inc., 1935, pp. 368-372.
2. Guthrie, E. R. *The Psychology of Learning.* New York: Harper and Bros., 1935, p. 244.
3. Hilgard, E. R. and Marquis, D. G. *Learning and Conditioning.* New York: D. Appleton-Century Co., 1940, p. 17.
4. Brown, J. F. *Psychology and the Social Order.* New York: McGraw-Hill Book Co., 1936, p. 78.

as an "ahistorical science", the ahistorical sciences being those concerned with "events independent of their past history".[5] Field theories, moreover, attempt to handle all scientific problems according to the logic of dynamics, thus assuming that differences between one science and another are merely differences in the structure and type of the respective fields. This assumption implies that all scientific events are marked by a degree of lawfulness which would warrant precise prediction. Acceptance of the method of field description, therefore, means the rejection of "statistical causal analysis which expresses predictions only in terms of probability coefficients" in favor of "dynamical causal analysis which expresses predictions in terms of exact amounts".[6] In other words, field theories assume that all natural processes are amenable to exact formulation, and this is an assumption which is opposed by the genetic point of view.[7]

Apart from field theories, another static mode of description of far-reaching importance to the science of human nature is that which may be designated the method of "class description."[8] In dealing with the adaptive life of men, and of other events as well, the tradition has become fixed that one should abstract the organism and the behavior from the context, and then bring into a single class all of those particulars of behavior which hold an important element in common. The consequence of this sort of analysis is the creation of causal relations between an agency derived from a class name and the particulars of behavior from which the class name has been derived. Common examples are the faculties of purpose, reason, and instinct, each naming an abstracted force, power, or agent lying within the organism as a sort of independent variable.

Field theories in psychology arose, in part, as a protest

5. *Ibid.*, p. 20.
6. *Ibid.*, p. 473.
7. Baldwin, J. M. *Development and Evolution.* New York: The Macmillan Co., 1902, p. 300.
8. Lewin, K. "The Conflict Between Aristotelian and Galilean Modes of Thought." *Journal of General Psychology,* 1931, 5, 141-177.

against class description.[9] Consequently, both the genetic position and the description of the dynamic properties of structured immediacies stand in opposition to this abstractive method.

With reference to the points at issue between the genetic and the static methods, two observations ought to be made. In the first place, it appears that either a genetic or a static method could be applied to any object of study or adapted to any scientific problem. The question arises, then, as to the nature of the criteria upon which the choice of one method rather than the other ought to rest. The answer appears to be that the basis of selection must be found in the purpose of the investigation and that the relative significance of the results which accrue would indicate the appropriateness of the method. In the second place, it is evident that the choice of a method must often depend upon considerations which are not merely methodological. In other words, since methods are the tools of concepts, it is necessary to examine the premises upon which a choice of one method rather than the other might be based. This is to say that the terms "static" and "genetic" are applicable, not only to methods of inquiry, but also to absolute views of the nature of nature, or, in particular, of the nature of man. This conclusion raises the question as to whether certain parts or aspects of nature, being genetic, require scientific investigation from the genetic point of view. It is a reasonable assumption that if the relative significance of the results derived from the application of a method is closely dependent upon the nature of the system under investigation, genetic events would require the genetic method of observation, whereas static systems might be described statically. Concrete comparisons can be used to support the argument that

9. Brown, following Lewin, has analyzed scientific language into "phenotypic" and "genotypic" description, the former type being the language of data and the latter the language of constructs. Phenotypic description abstracts the characteristics of behavior common to the individuals of a class and attempts to explain the behavior by reference to the nature of the class. (Brown, *op. cit.*, pp. 35-41).

organic, psychological, and social phenomena are of genetic constitution.[10]

Having identified these points of view, one logically moves on to a consideration of the nature of growth because it is only by reference to the basic features of growing systems in their longitudinal organization that the significance of the distinction between the genetic and the static for the understanding and control of growth through processes of education can be determined. Among the many possibilities, four criteria, viz., *emergence, directedness, kinship,* and *progressive individuation,* were accepted as appropriate to the present purpose of identifying the nature of growth processes. The meaning of these criteria, in their application to genetic events, may be noted as follows: *Emergence* asserts that certain aspects of natural processes are creative and, therefore, that qualities and modes of operation appear in the growth of human beings which can be said to be unpredictable. In other words, genetic systems display characteristics which are not deducible from what precedes. Since the subsequent terms of a genetic series of events are not the equivalent of the antecedent terms, counter-parts of the effect need not be found in the cause.[11] Conversely, the end-terms of a genetic process are not to be constructed before they have appeared. Emergence, in this sense of the term, is descriptive of growing systems because the appearance of the new and unique is one of the essential properties of growth. The doctrine of emergence clearly stands in opposition to the static assumption that the natural order is reducible to a single law or that differences in quality are reducible to difference in quantity.[12] Applied to the subject matter of psychology, for example, emergence would deny the "nothing but" hypothesis which insists that learning is merely a process of combining reflex arcs,[13] or, again, that the pro-

10. Baldwin, *op. cit.,* p. 330.
11. Broad, C. D. *The Mind and Its Place in Nature.* New York: Harcourt Brace and Co., 1925, ch. 11.
12. Lovejoy, A. O. "The Meaning of Emergence and Its Modes." *Journal of Philosophical Studies,* 1927, 2, 167-181.
13. Hughes, Percy. "Naturalists New and Old." *The Scientific Monthly,* 1935, 40, 265-269.

cesses and phenomena studied at the scientific level of psychology are "nothing but" those studied at the level of the physico-chemical sciences.[14] *Directedness* refers to the character of genetic processes which marks them as goal-tending along a route which is essentially unbroken and continuous. Two subordinate concepts, "serial order" and "irreversibility", serve further to define the directed inflection of developmental schedules. By serial order is meant the property of growth schedules to proceed in accord with a definite temporal arrangement of events. Extended experimental evidence indicates that growth is markedly patterned in this respect. In the development of psychological abilities, for instance, certain phases must appear in order to prepare the way for more advanced phases. Thus, a child is able to draw a circle before he can draw a square, and a square before he can draw a diamond, and so on. In physical growth, of course, many "scaffolding structures" appear which furnish foundations for subsequent structures and organs.[15] Irreversibility is a concept in which the one-way sequence of serial order may be formulated. Growing systems, in contrast to static cycles of change, proceed in their courses without a duplication of terms or happenings.[16] The progressive trend of growth toward increased complexity and differentation requires irreversibility.[17] *Kinship* takes account of the continuity and inter-relatedness of growth patterns, in their time-wise dimension. In contrast to the static description of stages, periods, discrete cross-sections, and the comparative doctrines they incite, kinship asserts both the immediate and the temporal unity of the members of a growing system. This character of growth is obviously in conflict with the cultural tendency to stratify the life span into a series of stages, the neonate, the child, the

14. Cason, Hulsey. "Organic Psychology. I. The Scientific Nature of Psychology." *Journal of Philosophy*, 1934, 31, 654-665.
15. Lillie, F. R. "The Problem of Vital Organization." *Philosophy of Science*, 1934, 1, 296-312.
16. Brownell, Baker. *The New Universe*. New York: D. Van Nostrand and Co., 1926, p. 78, 85.
17. Lillie, F. R. "Directive Action and Life." *Philosophy of Science*, 1937, 4, 202-203.

adolescent, and the adult. *Individuation,* finally, is a generalization about growth which applies to the process of increasing differentiation and specialization of parts and functions out of prior wholes. According to this criterion, each constituent part of a developmental schedule acquires a progressively individualized and self-contained character in the course of growth. The attainment of a high degree of specificity or particularization is significantly associated with functional efficiency and power. The progressive differentiation of parts which growth involves is exemplified in learning where parts of a behavior pattern are typically individuated out of a more generalized matrix of behavior.[18] This trend can be illustrated by the use of pairs of words which indicate the direction which the process of individuation follows. Some of these sets of words are: "syncretic-discrete", "general-specialized", and "diffuse-analytical".[19] The meaning of these terms becomes clear when applied to the development of the psychological functions which proceeds through individuation.

It is implied, of course, that these criteria of the genetic have a significant relationship to the definition of psychology, and especially to psychology in its application to educational theory and practice. By means of numerous instances drawn from the present and the immediate past, both of education and of the science of human nature, this fact can be illustrated. These criteria serve, moreover, to locate the points at which genetic and static assumptions about growth come into conflict. An especially noteworthy source of tension between the static and genetic lies in the meanings which words carry, and especially the meanings of those words which have originated in the pre-scientific era and have persisted into the present.[20] This tension and the resulting confusion are peculiarly apparent in educational thought because of the extent to which the

18. Brownell, W. A. *Learning as Reorganization.* Durham, N. C.: Duke University Press, 1939, ch. V.
19. Werner, H. *Comparative Psychology of Mental Development.* Translated by E. B. Garside. New York: Harper and Bros., 1940, pp. 51-325.
20. Coghill, G. E. "The Neuro-embryologic Study of Behavior: Principles, Perspective and Aim." *Science,* 1933, 78, 137.

institution of formal education is influenced by inertia in its cultural and social setting. The tension between the old and the new created by the survival of ancient theories regarding the nature of the mind serves as an illustration, With respect to the practical problems of education, the outcome evidently is that, in spite of the current interest in child development, the static approach is still dominant through concepts, methods, and practices in common use. In the classroom, as well as in the laboratory, the behavior of children, the measurement of abilities, and inferences regarding teaching method are treated statically as outcome, or product, rather than as process, route, or becoming. This assertion can be demonstrated in concrete cases by examining the major concepts of educational psychology, first, with respect to their historical background, and, second, with respect to current practice. The concepts considered in connection with the present inquiry are evidence of the fact that the static point of view dominates both theory and practice in education. It is true, of course, that the concepts inspected, rather than being consistently oriented with reference to the static and genetic, reveal now static, and again genetic, aspects. This is to be expected, since an "either-or" classification with respect to such criteria is difficult to establish. In spite of the lack of the degree of precision with which it is possible absolutely to classify each concept, the primary characteristics of the static and genetic positions as they relate to the concepts studied, can be clearly indicated.

The salient points can be set forth in due order in the following manner. In the case of the concept of original nature, the use of the abstractive method, and the correlative tendency to view growth as the result of intrinsic causes, are clearly marked as static.[21] It was observed that, in origin, the phrase "original nature" derives from absolutistic doctrines of the nature and causes of growth. A reflection of this absolutism is clearly observable in current theories of heredity

21. Lillie, F. R. "The Gene and the Ontogenetic Process." *Science,* 1927, 66, 368.

and of the role ascribed to the genes in determining hereditary traits.[22]

Many interpretations of the concept of learning, at least as far as theory is concerned, were judged to be static because so high a degree of constancy is imputed to the acquisition and retention of patterns of behavior.[23] That qualitative differences are reducible to differences in quantity, say of connections, or of memory traces, is an assumption which has strongly characterized current psychologies of education, and the teaching methods based upon them. In their preoccupation with neural connections, with the physical bases of learning, and with internal explanations of behavior, psychologists have afforded the teacher slight service in his task of directing and stimulating growth.[24]

The concept of intelligence, like that of original nature, is an abstraction from a vast number of facts about behavior which have been taken to have their primary reference to innate qualities. One significant conclusion for the practical processes of education is that, once intelligence levels have been determined, learners are segregated and presented with learning situations presumably appropriate to their intellectual capacities. It was noted that the probable result of this procedure is further to stabilize, at levels which have already become habitual, the various abilities of children who are yet in the middle of their route of becoming.[25] In so far as the treatment of learners is a matter of drill, which much of current education implies, the teaching attack is directed at the symptoms but not at the causes or conditions of low intelligence.

The problem of transfer of training serves to bring to a focus a significant educational application of the static-genetic

22. Morgan, T. H. "Genetics and the Physiology of Development." *The American Naturalist,* 1926, 60, 489-515.
23. Carr, H. A. "The Quest for Constants." *Psychological Review,* 1933, 40, 514-532.
24. Smith, B. O. "Immediate Quality: A Factor in the Application of Psychology." *Journal of Educational Psychology,* 1937, 28, 22-30.
25. Griffith, C. R. *Psychology Applied to Teaching and Learning.* New York: Farrar and Rinehart, Inc., 1939, p. 615.

issue which runs through the consideration of each of the foregoing concepts. It was pointed out that current practices in education appear to be primarily concerned with the acquisition of mental content.[26] According to the criteria of growth that have been set forth this is a static procedure. From the genetic point of view, the crucial measure of growth lies in the extent to which functional power is increased.[27] This judgment rests upon two assumptions: (1) that basic to the acquisition of content are the psychological abilities or functions, and (2) that these abilities can be progressively individuated from a more general form of "higher mental ability" through appropriate means of cultivation.

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26. Tyler, R. W. "The Relation Between Recall and the Higher Mental Processes," in C. H. Judd, *Education as Cultivation of the Higher Mental Processes.* New York: The Macmillan Company, 1936, pp. 6-17.
27. Werner, H. "Process and Achievement—A Basic Problem of Education and Developmental Psychology." *Harvard Educational Review,* 1937, 7, 353-368.

VITA

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